STUDY OF H- SHAPED ANTENNA FOR THE IMPROVEMENT OF RESONANCE FREQUENCY

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ABSTRACT:

In This article, the analysis of H-shaped microstrip patch antenna has discussed. Advantages of microstrip patch antenna in terms of low profile, low cost, lightweight and easy fabrication. Length, width, thickness of microstrip patch antenna plays an important role to change the resonance frequency of the patch antenna. I have analyzed the Resonance frequency of patch antenna is changing with respect to change in dimension of H-shaped Microstrip patch antenna.

KEYWORDS: ***Centre conductor strip, Feed point, Microstrip patch antenna, Resonance frequency, two identical conductor, dual linear polarization stacked patch antenna.***

I. INTRODUCTION

Microstrip patch antennas are widely used in synthetic aperture radar (SAR), wireless local area network (WLAN), Mobile communication system, Global positioning system (GPS). These application of MPA is applicable due to their various advantages such as light weight, low profile and easy to fabricate. It has some limitations such as low gain, narrow bandwidth, low efficiency,low power handling capacity [1-7]. Microstrip path antenna have advantage are low profile, low weight, low cost, easy in fabricationand integration with RF devices. An H -shaped microstrip antenna theory and experimental result given in [9]. H-shaped microstrip antenna has a small dimension than those of conventional half wavelength rectangular path antenna.

II. ANALYSIS OF H-SHAPED MICROSTRIP ANTENNA

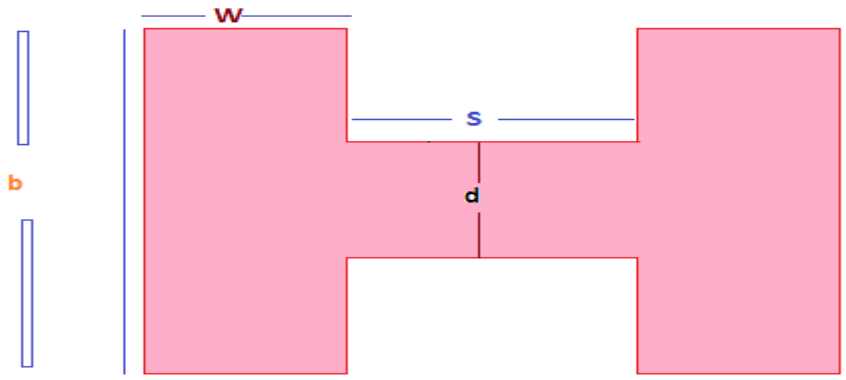

Fig 1. H-shape microstrip antenna

A. RESONANCE FREQUENCY

A system has a tendency to oscillate with maximum amplitude at some frequencies, these frequencies is called resonance frequencies**.**

B. ANALYSIS

The analysis result is taken from [2]

i. Analysis for center patch length 'd'

In H-shaped microstrip patch antenna there are different dimensions, some dimension plays important role in resonance frequency application. There is a center patch length 'd' which will change and make some important changes in resonance frequency of the H-shaped microstrip patch antenna.

ii. Some fix parameter

Parameters	Value
Relative per.	2.5
b	33 mm
w	14.3 mm
h	1.59 mm
s	26
Reflection coefficient	Constant

iii Resonant frequency after change in'd'

Value of 'd' in mm	Resonant frequency in GHz
33	1.74
10	1.14
2	0.75

Analysis with center patch length 'd' is taken, when some parameters are fixed like length 'b' is 33 mm, width of side patch length 'w' is 14.3 mm, height of side patch from center patch is 1.59 mm, width of center patch 's' is 26 mm, reflection coefficient is constant and relative permittivity is 2.5. When center patch length 'd' is 33 mm then resonant frequency is 1.74 Ghz, 1.14 Ghz when 10 mm, when it is 2 mm resonant frequency reach at 0.75 Ghz. As we say that Resonant frequency is decreasing with decrease in center patch length 'd' .Analysis with center patch length 'd' is taken, when some parameters are fixed like length 'b' is 33 mm, side patch length width 'w' is 14.3 mm, height of side patch from center patch is 1.59 mm, width of center patch 's' is 26 mm, reflection coefficient is constant and relative permittivity is 2.5. So it has proved that when dimensions of the 'd' will change the change in exact resonance frequency of the antenna. We can say that decrease in dimension of 'd' will decrease the resonance frequency. Nowadays patch antennas with high permittivity sintered material substrate are used for GPS automotive applications. These very compact antennas are quite expensive and enough prone to circular polarization.

Fix parameter with for change in‘s’

Parameters	Value
Relative per.	2.5
b	33 mm
w	14.3 mm
h	1.59 mm
d	15 mm
Reflection coefficient	Constant

Resonant frequency after change in ‘s’

Value of ‘s’ in mm	Resonant frequency in GHz
4.088	2.17
14.99	1.59
20.44	1.41
26	1.29

Analysis with center patch width ‘s’ is taken, when some parameters are fixed like length ‘b’ is 33 mm, width of side patch length ‘w’ is 14.3 mm, height of side patch from center patch is 1.59 mm, length of center patch ‘d’ is 15 mm, reflection coefficient is constant and relative permittivity is 2.5. when center patch length ‘s’ is 4.088 mm then resonant frequency is 2.17 Ghz, 1.59 Ghz when 14.99 mm, when it is 20.44 mm resonant frequency reach at 1.41 Ghz and with 26 mm it is 1.29 Ghz. As we say that resonant frequency is decreasing with increasing in center patch width.

iii.Change in ‘w’,[2]

iii. Some fix parameter is given

some fix parameters are given bellow which are constant for the observation, after that will compare the changes which will happened to change in resonance frequency.

Parameters	Value
Relative per.	2.5
b	33 mm
d	15 mm
h	1.59 mm
s	26 mm
Reflection coefficient	Constant

iv. Resonant frequency after change in ‘w’

we are doing some changes in the side patch width of H-shaped micro strip patch antenna, and will observe that changes are happening. Observation are given bellow

Value of 'w' in mm	Resonant Frequency in GHz
4.769	1.97
9.538	1.55
19.08	1.13
24.5	0.96

Analysis with side patch width 'w' is taken, when some parameters are fixed like length 'b' is 33 mm, width of center patch width's' is 26 mm, height of side patch from center patch is 1.59 mm, length of center patch 'd' is 15 mm, reflection coefficient is constant and relative permittivity is 2.5. When side patch width 'w' is 4.769 mm then resonant frequency is 1.97 Ghz, 1.55 Ghz when 19.538 mm, when it is 19.08 mm resonant frequency reach at 1.13 Ghz and with 24.5 mm it is 0.96 Ghz. As we say that Resonance frequency is decreasing with increasing in side patch width.

III. CONCLUSION

As we analysis the result resonant frequency is flexible with change in dimensions of the H-shaped micro strip patch antenna. So we can tune our system at desire frequency with change in receiver and transmitter dimensions. A receiver is a device, where transmitted signal received and at that device it will tuned at desire frequency with the complete oscillation process. If the received signal bandwidth is maximum then it will tuned with maximum amplitude. An amplitude is a main factor which effect the resonance frequency. If amplitude of received signal is maximum then it will works well as known. Some of the application in the world are the military application, radar application. Today our devices are very compact in size so need very small antenna, for small antenna it is more important that our antenna should be very directive in nature. Much efficient for the reason of power, return loss should be maximum. The oscillation should be with maximum amplitude. Return loss should play an important role in the properties of patch antenna. Nowadays patch antennas with high permittivity sintered material substrates are used for GPS automotive application. These very compact antennas are quite expensive and enough prone to circular polarization. Degradation due to the positioning of the antenna on the car body. As a rule near the scattering age of the metallic roof the aim of this paper is to realize a robust circular polarization antenna for GPS application using low cost micro strip substrate where the low noise amplifier may be easily integrated. It must be noticed that to get circular polarization slits lengths and width should be identical and symmetric with respect to orthogonal axis, a slight asymmetric can produce strong degradation of the polarization purity because the two principle axis modes can go to resonate on different frequencies. To increase antenna efficiency and gain a low loss material should be used to fabricate the patch. To get an effective increase of antenna gain the ground plain under the patch should increase proportionally with patch dimensions.. Return loss should play an important role in the properties of patch antenna. Nowadays patch antennas with high permittivity sintered material substrates are used for GPS automotive application.

IV. APPLICATION

The design adopts patch structure introducing low profile multiband, high gain and compact antenna element. The design is suitable for application in L- band, S- band and X- band communication. Design results are obtained by high frequency structure simulator which is used for simulating microwave passive components. Microstrip patch antennas are widely used in synthetic aperture radar (SAR), wireless local area network (WLAN), Mobile communication system, Global positioning system (GPS). These application of MPA is applicable due to their various advantages such as light weight,

low profile and easy to fabricate.In this paper a micro strip patch H-shaped micro strip patch antenna thinner and cheaper than the thick ceramic patch antenna usually employed for automotive application was proposed and analyzed this configuration allows to easily integrate a low noise amplifier antenna to the thicker high permittivity ceramic patch solution a gain reduction of about 1.5 dB is observed. If amplitude of received signal is maximum then it will works well as known. Some of the application in the world are the military application, radar application. Today our devices are very compact in size so need very small antenna, for small antenna it is more important that our antenna should be very directive in nature. Much efficient for the reason of power. In present time world is using high speed internet devices which will work on the maximum resonance frequency. Resonance frequency will play an important role in the complete world. We are using mobile phones which have needed very much of compact band and high speed with maximum bandwidth and resonance frequency.

V. REFFERENCES

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